02-28-07

PATENT AF

Attorney Docket No.: 2023796-7036165001

Certificate of Mailing/Transmission (37 C.F.R. § 1.8(a)):
I hereby certify that this paper is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" (Express Mail Label No. EV 348154596 US under 37 CFR § 1.10 on the date indicated and is addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
Dated: February 26, 2007 Name of Person Certifying: Steven C. Garland Printed Name: Steven C. Garland

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Jon C. Taenzer

Serial No.: 10/812,718

Filed: March 29, 2004

For: HEARING SYSTEM BEAMFORMER

Confirmation No.: 3745

Group Art Unit: 2644

Examiner: Ping Lee

APPEAL BRIEF TRANSMITTAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir,

In response to the Notification of Non-Compliant Appeal Brief mailed November 14, 2006, Applicants respectfully submits revised Appeal Brief.

☒ Appeal Brief (13 pages) (in triplicate)

☒ No additional fee is deemed necessary in connection with the filing of this Corrected Appeal Brief. However, if the Patent Office determines that other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-2518**, referencing billing number **2023796-7036165001**.

Respectfully submitted,

Dated: February 26, 2007

By: _____
Jasper Kwoh
Reg. No. 54,921

BINGHAM McCUTCHEN LLP
Three Embarcadero
San Francisco, CA 94111-4067
(650) 849-4960

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:	Group Art Unit: 2644
Jon C. Taenzer	Examiner: Ping Lee
Serial No.: 10/812,718	
Filed: March 29, 2004	
For: HEARING SYSTEM BEAMFORMER	

APPEAL BRIEF UNDER 37 CFR § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In response to the Notice of Non-Compliant Appeal Brief, Applicant hereby submits a revised Appeal Brief to address the alleged deficiency. Applicant submits this Appeal Brief pursuant to the Notice of Appeal filed May 23, 2006. This brief is submitted in triplicate.

I. REAL PARTY IN INTEREST

The real party in interest is the assignee GN Resound North America Corporation.

II. RELATED APPEALS AND INTERFERENCES

To the best of Applicant's knowledge, there are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-16 were canceled. Claims 17-35 are pending. Claims 17-35 are rejected, and are appealed. Claims 17 and 23 are independent claims.

IV. STATUS OF AMENDMENTS

Amendment After Final under 37 C.F.R. § 1.116 was filed on February 28, 2006, in which claims 36-52 were canceled. The amendments to the claims were entered according to the Advisory Action mailed on March 15, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present section of the Appeal Brief is set forth merely to comply with the requirements of 37 C.F.R. § 41.37(c)(v) and is not intended to limit the pending claims in any way.

Claim 17 recites:

A method of achieving directional pickup of a radiated energy signal using a shadowing effect created by an energy propagation barrier, the method comprising:

locating a first sensor on one side of the barrier and a second sensor on an opposite side of the barrier;

determining a difference between amplitudes of signals respectively produced by the first and second sensors;

adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals; and

summing together the adjusted signals to produce a directional signal.

Claim 23 recites:

Apparatus for achieving directional pickup of a radiated energy signal using a shadowing effect created by an energy propagation barrier, the apparatus comprising:

a first sensor configured for being located on one side of the barrier;

a second sensor configured for being located on an opposite side of the barrier;

processing circuitry configured for determining a difference between the amplitudes of signals respectively produced by the first and second sensors, for adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals; and for summing together the adjusted signals to produce a directional signal.

Examples of a method that includes locating a first sensor on one side of the barrier and a second sensor on an opposite side of the barrier, determining a difference between amplitudes of signals respectively produced by the first and second sensors, adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals, and summing together the adjusted signals to produce a directional signal, are described on pages 5-17 of the specification.

Examples of an apparatus for achieving directional pickup of a radiated energy signal using a shadowing effect created by an energy propagation barrier, having a first sensor configured for being located on one side of the barrier, a second sensor configured for being located on an opposite side of the barrier, and processing circuitry configured for determining a difference between the amplitudes of signals respectively produced by the first and second sensors, for adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals, and for summing together the adjusted signals to produce a directional signal, are described on pages 5-17 of the specification.

In particular, with respect to embodiments covered by claims 17 and 23, figures 2, 7, 8, 9 discloses left and right sensors for generating respective signals, wherein the sensors are adapted to be placed on either side of a head (barrier). Also, page 15, lines 18-21 disclose amplitude difference between right ear and left ear signals in relation to head shadowing effect, page 15, lines 5-14 discloses beamforming technique based on head shadowing effect to optimize signal-to-noise ratio and adjusting amplitudes in a beamformer embodiment, and figures 15, 16, 19, and 20 and page 16, line 19 to page 17, line 23 disclose interaural difference, and adjusting signals based on the interaural difference. Also, figures 2, 7, 8, 9 illustrates a summer for summing signals to produce a directional signal.

VI. ISSUES

The issues for this appeal are (A) whether claims 17-52 comply with the written description requirement under 35 U.S.C. § 112, (B) whether claims 17, 19-21, 23, 25-27, 36, 46, and 47 are patentable under 35 U.S.C. § 102(b) over "Microphone-Array Hearing Aids with Binaural Output - Part II: A Two-Microphone Adaptive System" by Daniel P. Welker ("Welker"), and (C) whether claims 17, 18, 23, 24, 36, 42-45, and 49-52 are patentable under 35 U.S.C. 103(a) over U.S. Patent No. 6,697,494 ("Klootsema").

VII. ARGUMENTS

Claims 18-22 and 29-32 depend from independent claim 17, and therefore, rise and fall with claim 17. Claims 24-28 and 33-35 depend from independent claim 23, and therefore, rise and fall with claim 23.

A. Claim Rejections under 35 U.S.C. § 112

Claims 17-52 stand rejected under 35 U.S.C. § 112 as allegedly failing to comply with the written description requirement. For written description rejection under § 112, "the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed." MPEP 2163.02. Also, the "subject matter of the claim need not be described literally (i.e., using the

same terms or in haec verba) in order for the disclosure to satisfy the description requirement." MPEP 2163.02.

According to the Office Action, the specification allegedly does not disclose a difference between amplitudes of signals respectively produced by the first and second sensors, and adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals, as recited in claim 17, and similarly recited in claim 23. Applicant respectfully disagree. Page 15, lines 18-21 of the application disclose amplitude difference between right ear and left ear signals in relation to head shadowing effect. In addition, page 15, lines 5-14 discuss beamforming technique based on head shadowing effect to optimize signal-to-noise ration, and adjusting amplitudes in a beamformer embodiment. Furthermore, figures 15, 16, 19, and 20, and their corresponding passages discuss interaural difference, and adjusting signals based on the interaural difference. Beamforming technique for adjusting signals is also discussed throughout the specification. As such, the specification conveys to those skilled in the art that Applicant was in possession of the claimed invention. For at least the foregoing reasons, Applicant respectfully submits that claims 17-52 satisfy 35 U.S.C. § 112.

B. Claim Rejections under 35 U.S.C. § 102

Applicant respectfully notes that in order to sustain a claim rejection under § 102, each of the claimed elements must be disclosed, either expressly or inherently, in the cited reference. Applicant submits that claims 17 and 23 are patentable over Welker because Welker does not disclose or suggest one or more limitations recited in these claims.

Claim 17 recites determining a difference between amplitudes of signals respectively produced by the first and second sensors, and adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals. Claim 23 recites similar limitations. Welker does not disclose or suggest the above limitations. Welker discloses a microphone system, wherein signals from right and left microphones, f_R and f_L, respectively, are adjusted (See figure 2). Notably, in the top line of figure 2, signal f_L is added to signal f_R, and in the bottom line, signal f_L is subtracted from signal f_R. As such, Welker does not disclose or suggest adjusting amplitudes of

signals (e.g., both left and right signals) based on a determined amplitude difference (i.e., the same amplitude difference).

According to the Advisory Action, figure 2 of Welker allegedly discloses modifying left signal by Wk, and modifying right signal by Wk. Applicant respectfully disagree. First, Wk is not an amplitude difference. As such, even assuming that Welker discloses modifying left and right signals based on Wk (which is not true), Welker still does not disclose or suggest modifying left and right signals based on an amplitude difference. In addition, figure 2 discloses that Wk is used in a signal path for the left sensor, and that Wk is not used in the right signal path. As such, figure 2 of Welker does not disclose or suggest the above limitations.

For at least the foregoing reasons, Applicant respectfully submits that claims 17 and 23, and their respective dependent claims, are patentable over Welker under 35 U.S.C. § 102.

C. Claim Rejections under 35 U.S.C. § 103

Applicant submits that claims 17 and 23 are patentable over Klootsema.

Claim 17 recites determining a difference between amplitudes of signals respectively produced by the first and second sensors, and adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals. Claim 23 recites similar limitations. Applicant agrees with the Examiner that Klootsema does not disclose or suggest determining an amplitude difference. According to the Office Action, it would have been allegedly obvious to modify Klootsema by determining an amplitude difference so that the signals may be adjusted. Applicant respectfully disagrees. Klootsema discloses matching the levels of microphone signals, and does not disclose or suggest determining an amplitude difference, and adjusting signals based on the same determined amplitude difference. Also, just because matching of signals is disclosed, it does not necessitate a finding that the matched signals are determined based on an amplitude difference. As the Examiner correctly pointed out, there are different techniques that can be used to match signals. For example, two signals may be matched by adding the two signals and taking an average, in which case, there will be no need to determine an amplitude difference. As another example, two signals may also be matched by making one equal to the other. In such case, there will also be no need to determine an amplitude difference. Furthermore, even assuming that Klootsema discloses determining amplitude difference (which is not true), there is nothing in Klootsema that

disclose or suggest adjust left signal based on the amplitude difference, and adjusting right signal based on the amplitude difference.

For at least the foregoing reasons, Applicant respectfully submits that claims 17 and 23, and their respective dependent claims, are patentable over Klootsema under 35 U.S.C. § 103.

VIII. CONCLUSION

For the above reasons, Applicant respectfully submits that rejection of claims 17-35 has been overcome. Accordingly, Applicant requests that the Board of Patent Appeals and Interferences overrule the Examiner and allow claims 17-35.

Respectfully submitted,

Bingham McCutchen LLP

Dated: February 26, 2007

By: _____
Jasper Kwoh
Reg. No. 54,921

Three Embarcadero Center
San Francisco, CA 94111-4067
Telephone: (650) 849-4904
Telefax: (650) 849-4800

APPENDIX A: Pending Claims

Listing of Appealed Claims 17-35.

17. (Previously Presented) A method of achieving directional pickup of a radiated energy signal using a shadowing effect created by an energy propagation barrier, the method comprising:

locating a first sensor on one side of the barrier and a second sensor on an opposite side of the barrier;

determining a difference between amplitudes of signals respectively produced by the first and second sensors;

adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals; and

summing together the adjusted signals to produce a directional signal.

18. (Original) The method of claim 17, wherein the adjusted signals are of approximately equal magnitude.

19. (Previously Presented) The method of claim 17, wherein the adjusted signals are summed together to produce multiple directional signals.

20. (Original) The method of claim 19, wherein the multiple directional signals form a binaural signal pair including a first directional signal in which energy from the first sensor is greater than energy from the second sensor, and a second directional signal in which energy from the second sensor is greater than energy from the first sensor.

21. (Previously Presented) The method of claim 17, further comprising, for each of multiple frequency bands:

deriving a phase correction value; and

applying the phase correction value within that frequency band.

22. (Previously Presented) The method of claim 21, wherein the amplitude difference between the signals is determined within each of the multiple frequency bands, and the phase correction value determination is based on the amplitude difference determined within the respective frequency band.

23. (Previously Presented) Apparatus for achieving directional pickup of a radiated energy signal using a shadowing effect created by an energy propagation barrier, the apparatus comprising:

a first sensor configured for being located on one side of the barrier;

a second sensor configured for being located on an opposite side of the barrier;

processing circuitry configured for determining a difference between the amplitudes of signals respectively produced by the first and second sensors, for adjusting the amplitudes of the signals based on the determined amplitude difference to produce adjusted signals; and for summing together the adjusted signals to produce a directional signal.

24. (Original) The apparatus of claim 23, wherein the adjusted signals are of approximately equal magnitude.

25. (Previously Presented) The apparatus of claim 23, wherein the processing circuitry is configured for summing together the adjusted signals to produce multiple directional signals.

26. (Original) The apparatus of claim 25, wherein the multiple directional signals form a binaural signal pair including a first directional signal in which energy from the first sensor is greater than energy from the second sensor, and a second directional signal in which energy from the second sensor is greater than energy from the first sensor.

27. (Previously Presented) The apparatus of claim 23, wherein the processing circuitry is configured for, for each of multiple frequency bands, deriving a phase correction value and applying the phase correction value within that frequency band.

28. (Previously Presented) The apparatus of claim 27, wherein the processing circuitry is configured for determining the amplitude difference between the signals within each of the multiple frequency bands, and the processing circuitry is configured for deriving a phase correction value based on the amplitude difference determined within the respective frequency band.

29. (Previously Presented) The method of claim 17, wherein the energy propagation barrier is the head of a user.

30. (Previously Presented) The method of claim 17, wherein the signals are sound signals.

31. (Previously Presented) The method of claim 30, further comprising processing the directional signal to produce a resultant sound.

32. (Previously Presented) The method of claim 31, further comprising inputting the resultant sound into left and right ears of a user.

33. (Previously Presented) The apparatus of claim 23, wherein the energy propagation barrier is the head of a user.

34. (Previously Presented) The apparatus of claim 23, wherein the first and second sensors are microphones.

35. (Previously Presented) The apparatus of claim 23, wherein the processing circuitry comprises a digital signal processor (DSP).

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None